



Annual Review of Organizational Psychology and Organizational Behavior

Challenges in the New Economy: A New Era for Work Design

Franco Fraccaroli,¹ Sara Zaniboni,^{2,3} and Donald M. Truxillo⁴

¹Department of Psychology and Cognitive Sciences, University of Trento, Rovereto, Italy; email: franco.fraccaroli@unitn.it

²Department of Psychology, University of Bologna, Cesena, Italy

³Department of Management, Technology, and Economics, ETH Zürich, Zürich, Switzerland

⁴Department of Work and Employment Studies, Kemmy Business School, University of Limerick, Limerick, Ireland

Annu. Rev. Organ. Psychol. Organ. Behav. 2024.
11:6.1–6.29

The *Annual Review of Organizational Psychology and Organizational Behavior* is online at
orgpsych.annualreviews.org

<https://doi.org/10.1146/annurev-orgpsych-081722-053704>

Copyright © 2024 by the author(s).
All rights reserved

Keywords

work design, new technologies, diversity at work, new features of work, job analysis

Abstract

Models of work design emerged in the twentieth century to address workplace changes created by the industrial revolution. However, the world of work is currently undergoing a new, profound revolution in terms of technological, demographic, and environmental changes, leading to a new economy, within which organizations and employees must function. The field of work design currently includes robust theories with a deep understanding of how work design affects employee outcomes, many with relevance to this new economy. However, the new economy also includes issues never before considered (e.g., algorithmic management and gig and lone work), and the field of work design must tackle the implications of these emerging issues. In this article, we review the general findings on work design and then examine a range of contextual, economic, technological, and diversity issues and their relevance to work design. We conclude with an agenda for future work design research and implications for work analysis and work design interventions and policies.



1. INTRODUCTION

The importance of formalized work design to organizational life has been recognized since the beginning of the twentieth century, starting with Taylorism and continuing through more humanistic approaches in the middle of the century. Much of this work on job design was in response to the industrialization of the workplace. However, the workplace is now experiencing another revolution—a new economy—including factors such as the technological revolution, increased diversity, and concerns over environmental sustainability. It is time to reevaluate organizational psychology's current approaches to work design and redesign.

This article focuses on work design and redesign and their effects on the productivity, performance, attitudes, and well-being of workers in light of the new economy. In Section 2, we present an overview of different work design features and their effects on organizational life (productivity and quality of relationships) and on individuals' work experience (well-being, attitudes, and organizational behaviors). However, the aim of this article is not to provide a comprehensive review of theories and empirical evidence related to work design; as of 2017, there were more than 17,000 articles published on this topic (Parker et al. 2017), and readers can find detailed, in-depth reviews and meta-analyses on work design and related frameworks (e.g., sociotechnical systems, job demands–resources theory, and role theory) (Grant et al. 2010, Humphrey et al. 2007, Lesener et al. 2019, Parker 2014, Parker et al. 2017). Rather, we examine work design from a cross-cultural, cross-economic perspective, exploring how work design can be applied to workplaces with different levels of economic, technological, and organizational development, including what it means to deal with work design in contexts of low-skilled and impoverished work.

The core aim of this article, presented in Section 3, is to identify economic, organizational, technological, and demographic trends that influence work design. Examples of these changes include the introduction of new technologies [e.g., artificial intelligence (AI), robotics, and algorithmic management], different characteristics of the workforce (e.g., demographic changes, disability, and ethnicity), and emerging features of work itself (e.g., crafting, sustainability, and insecurity). Our main focus is on how work design is affected, intentionally and unintentionally, in this dynamic environment, including key changes in economic, social, and organizational contexts. In Section 4, we identify critical research questions for studying work design in the new economy, as well as implications for the practice of work analysis and the development of successful work design interventions. The framework of our article is presented in **Figure 1**.

2. WORK DESIGN AND ITS CONTEXT

2.1. The Evolution of the Concept of Work Design

The concept of what is meant by work design has evolved over the decades. In this section, we provide a brief history of work design and its importance to the experience of work.

2.1.1. Definitions. In the pioneering research by Hackman & Oldham (1980), job design is viewed as a set of opportunities and constraints structured into assigned tasks and responsibilities that affect how employees accomplish and experience work. In more recent perspectives, job design is defined more broadly as the processes and outcomes of how work is structured, organized, and experienced (Grant et al. 2010, Parker 2014). This dynamic perspective focuses on the link between work design and organizational contexts. Additionally, other developments (Morgeson & Humphrey 2008) use the term work design rather than job design to denote the environment within which jobs and roles are enacted. In addition, this shift places greater emphasis on the role of individuals not only as executors of a task but also as creators, at least in part, of their own work, that is, their ability to craft their jobs. This **job-crafting** perspective emphasizes a bottom-up

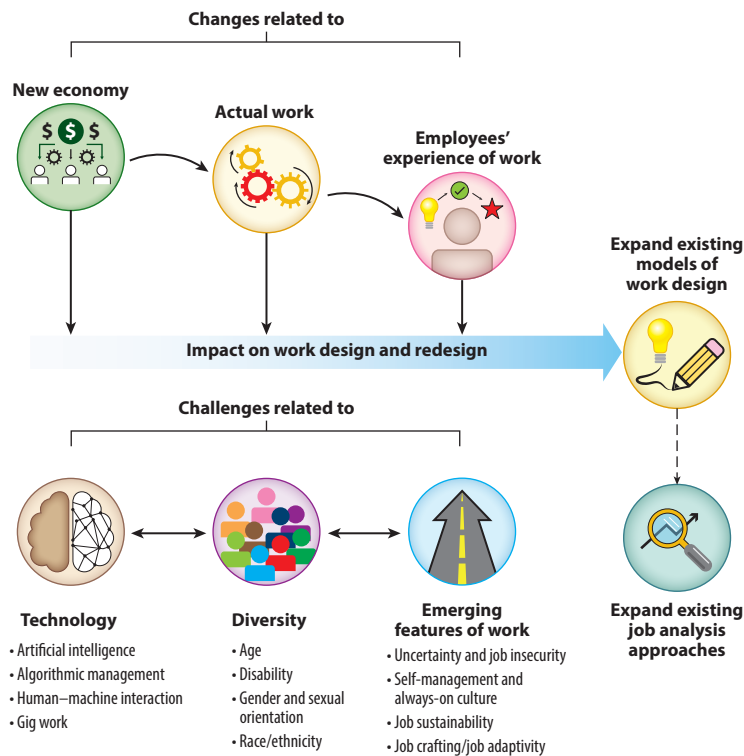


Figure 1

The framework of the article: changes and challenges in the content and context of work that affect job design.

approach to work design, in which personal initiative and proactivity play a significant role. In brief, the definition of work design evolved from a focus on a narrow, fixed, and prescribed job to a broader definition of work design and redesign that acknowledges the task, the link between jobs and the environment, and the role of the employees in emergent and self-initiated activities inside a flexible organization (Morgeson & Humphrey 2006). Furthermore, it is important to recognize that work design can come from the top or from employees (e.g., job crafting) and emerge spontaneously in response to a problem.

2.1.2. Why job characteristics matter. One of the main strands of work design research focuses on how workers experience different characteristics of work and the link between this experience and other psychological states (e.g., attitudes, motivation, and behaviors). Hackman & Oldham's (1975, 1976) job characteristics model (JCM) identified five job features considered fundamental in promoting or inhibiting work motivation and satisfaction: skill variety, task identity, task significance, autonomy, and feedback from the job itself. These five features of work affect three critical psychological states: meaningfulness, experienced responsibility, and knowledge of results. Humphrey et al. (2007) confirmed meta-analytically that these psychological states (particularly meaningfulness) mediate the relationship between the five job characteristics and important outcomes such as performance attitudes, motivation, and well-being. In short, there is a link between how a job is organized and the psychological experience of the job and important worker outcomes. In addition, Morgeson & Humphrey (2006) expanded Hackman and Oldham's taxonomy by developing the Work Design Questionnaire (WDQ) and conceptual framework, which



Table 1 Work characteristics in the Work Design Questionnaire^a

Category of work design characteristics	Features of work
Task characteristics	Work scheduling autonomy Work method autonomy Decision-making autonomy Task variety Task significance Task identity Feedback from job
Knowledge characteristics	Job complexity Information processing Problem-solving Skill variety Specialization
Social characteristics	Social support Interdependence Interaction outside the organization Feedback from others
Work context	Ergonomics Physical demands Work conditions Equipment use

^aTable adapted from the Morgeson & Humphrey (2006) Work Design Questionnaire.

identified additional work characteristics organized into four categories (task, knowledge, social, and contextual characteristics; see **Table 1**).

Humphrey and colleagues’ meta-analysis found that all work characteristics considered together—task, knowledge, social, and contextual factors—accounted for more than half of the variance in job satisfaction and more than one-third of the variance in experienced stress (Humphrey et al. 2007). In addition, this line of job design research paved the way for the measurement of work design from the worker’s perspective with the construction of detailed questionnaires [e.g., the WDQ (Morgeson & Humphrey 2006)].

2.2. Work Design and the Role of Context

In this section, we describe how the context of work has affected work design, the implications for the conceptualization of work design, and the empirical evidence.

2.2.1. The changing context for organizations and work. Studies on work design have gained renewed attention in the last decade, thanks to a broader perspective that takes into account the role of the organizational and the socioeconomic contexts (Grant et al. 2010, Johns 2006). For example, in a special issue of the *Journal of Organizational Behavior* in 2010, there was a call to resume studies on work design, including interdisciplinary and cross-cultural approaches (Grant et al. 2010). There is also potential for new work design features that could influence psychological outcomes (e.g., Morgeson et al. 2010). The following are some additional contextual changes:

1. Changes in the general economic system, with a shift from a manufacturing to a service economy and an increase in the relational nature of work activities such as cooperation, interdependence, and emotional engagement with colleagues, customers, and users, imply an emerging focus on relational work design (Grant 2007).



2. Changes due to the introduction of new technologies, with changes from physical to cognitive activities, mean that workers will have challenging new cognitive demands and will need to update their competencies; adapt to new forms of control and evaluation; and interact with robots, algorithms, and AI (Cascio & Montealegre 2016).
3. Changes in the way work is delivered, such as the trend toward virtual teams and telework, mean that work is no longer necessarily carried out in a fixed place or according to a fixed schedule. This gives employees more autonomy in designing and redesigning their work and emphasizes the agentic role of employees in negotiating their work roles with supervisors (Hornung et al. 2010).
4. Changes linked to the nature of employment contracts, which have seen a global increase in more flexible and sometimes precarious contractual forms in recent decades (Spreitzer et al. 2017), suggest an increase in job insecurity due to layoffs; flattened hierarchies and reduction of managerial levels; higher demands for skills; and, unfortunately, the persistence of a low-wage labor market for unskilled workers (Osterman 2010).
5. Changes in the composition of the labor force, with significant worldwide growth in the presence of women in the workforce and significant and generalized aging of labor forces (Fraccaroli et al. 2017), mean greater inclusion of people with disabilities, ethnic diversity, people facing migration and cultural adaptation, and workers experiencing different forms of social marginalization.

Note that each of these changes—in the economy, technology, work configurations, employment relationships, and labor force composition—will need to be addressed across the different areas of human resources (HR). Each change signals realignments in classic HR functions such as recruitment (e.g., what attracts applicants), selection (e.g., the skills the organization needs), training (e.g., how to support employees in a dynamic job design environment), and performance management (e.g., expectations for employment relationships).

2.2.2. Work design in context: empirical evidence. Wegman et al. (2018) provide empirical evidence for how changes in the nature of work affect perceptions of job characteristics. They meta-analytically examined changes in perceptions of Hackman & Oldham's (1975) model from 1975 to 2011, finding that over that period, workers perceived higher levels of skill variety (attributable to greater complexity and cognitive demand) and autonomy (greater flexibility in working times). They did not find significant changes in the other three job characteristics. Importantly, there was no evidence of changes in the value workers placed on enriched work. However, the study's limitations should be noted, as it covered a specific cultural context (i.e., the United States) and a now remote historical period and was based on a job design model that has since been conceptually enriched. Furthermore, causal attributions for these changes in job perception are purely speculative.

Another way to study the role of context in work design has been explored by Dierdorff & Morgeson (2013), examining how occupational values affect work design. They concluded that task characteristics are shaped by occupational values that are reinforced by the self (e.g., achievement and independence), social characteristics are influenced by occupational values that derive reinforcement from others (e.g., altruism and status), and contextual characteristics are influenced by occupational values that draw reinforcement by contextual characteristics (e.g., safety and comfort).

When discussing context, it is also necessary to note how, on a global level, work has been affected by the coronavirus disease 2019 (COVID-19) pandemic. Lockdowns, social distancing, and temporary closures have significantly changed the ways we produce goods and services (Rudolph et al. 2021). During the pandemic, we witnessed what Kramer & Kramer (2020) have called the

“great work from home experiment,” a mass work experience that has triggered and accelerated a series of ongoing changes in work. As a result, two key change processes have emerged (Malhotra 2021). The first concerns the level of work autonomy. The remote working experience during the pandemic is expected to have accelerated workers’ expectations for autonomy regarding tasks performed, procedures and methods of carrying out one’s job, where work is carried out, its temporal organization, and the goals to be achieved (i.e., goal autonomy). This extreme autonomy can be associated with emerging demands for a rebalancing between work and nonwork life.

The second process accelerated by the COVID-19 pandemic and facilitated by technology concerns a marked shift in organizational governance from managerial hierarchies and the authority of supervisors to automated and algorithmic HR management systems for work allocation, reward, and evaluation. Here, the paradox of autonomy is evident. On the one hand, there is a drive toward greater autonomy in structuring one’s work; on the other, the methods and tools for regulating and controlling work through impersonal algorithms are becoming more stringent (e.g., surveillance of worker activity, limitations on acceptable work behaviors, AI solutions focused on outcomes over interpersonal processes), leading to the perception that autonomy is eroding. To address these contradictory change processes, Malhotra (2021) proposes mindful work design to balance technology and the interpersonal collaboration of people working online to promote focused thinking, recovery, and collaboration with colleagues and meaningful work design to emphasize the social impact of work and to foster intrinsic motivation based on interests, passions, and innovation.

2.3. Work Design in the Socioeconomic Context: A Cross-Cultural Perspective

In this section, we discuss how economic issues, an increased recognition of the role of workplace and societal inequality, and public policies play a role in work design.

2.3.1. Factors affecting work design and redesign. Clearly, many factors in the new economy affect work design. Conceptual models have emerged to better understand how these economic, technological, organizational, social, and cultural forces affect work and work design. Parker et al. (2017) and Parker & Jorritsma (2021) propose a multilevel model:

1. Work design within an organization is established through formal decision-making processes by management and supervisors, who determine elements such as the division of tasks, degree of autonomy, team composition, evaluation mechanisms, reward systems, and production objectives.
2. Individuals and groups carrying out their assigned tasks shape and influence their jobs (job crafting).
3. The motivations and the knowledge, skills, abilities, and other characteristics (KSAOs) of management and employees affect job characteristics.
4. Distal context factors influence work design and redesign. These include external forces (e.g., national regulations), organizational forces (e.g., strategies and structure), and local context (e.g., team functioning), and they affect job design both directly (e.g., laws affect safety tasks) and indirectly (e.g., laws affect KSAOs and views of managers and employees).

This model is valuable in that it illustrates the need to consult multiple disciplines, such as economics, sociology, political science, and computer science, in addition to industrial and organizational psychology and organizational behavior. It also suggests that organizations should consider their job design strategies closely, taking these processes into account and fitting them to their specific context. Moreover, their own HR processes and functions can be used strategically

both as a means of data collection (e.g., What do we need in terms of job design? What do workers want?) and as levers for implementing work design and redesign.

A cross-cultural approach is crucial for understanding the influence of contextual factors as they are configured in different geographic contexts, areas with varying levels of economic and technological development, and countries with unique regulatory systems. Furthermore, the macroeconomic processes of globalization and market liberalization (Parker et al. 2017) play a role, leading to reduced investments in personnel safety and training, diminished work quality, and pressure on production costs, resulting in increased workloads and deskilled jobs. The chain of connections between macroeconomic events, organizational strategies, and work redesign can vary greatly depending on the system of labor protections, the power of unions, unemployment rates, and the managerial culture, which are more or less focused on worker well-being in different national, cultural, and organizational contexts. Some cross-national research illustrates how broad contextual factors can affect work design. A study of call center operators (Holman 2013a) showed that call center job quality was highest in inclusivist regimes (e.g., Denmark and Sweden) and higher in dualist regimes (e.g., Austria and France) than in market regimes (e.g., Canada, the United Kingdom, and the United States). Holman (2013b) found significant differences in job quality (working conditions, security and flexibility, and development opportunities) between countries with social democratic, continental, liberal, and southern European regimes.

Recently, Carter et al. (2023) systematically adopted a cross-cultural perspective in the study of work design. Recognizing the scarcity of studies based on cross-cultural comparisons, the authors conducted a narrative review and a meta-analysis of 389 studies in 39 countries to examine the degree of variability between cultures regarding the relationship between work design characteristics and some workplace outcomes (e.g., job satisfaction and performance). They examined the cultural dimensions of power distance, individualism–collectivism, masculinity–femininity, uncertainty avoidance, long-term orientation, and indulgence–restraint. Notably, the meta-analysis examined configurations of cultural dimensions as moderating variables, with each country as a specific configuration of multiple cultural dimensions (i.e., a complex universal approach) rather than individual cultural dimensions. In general, the authors found that the influence of work design on workplace outcomes is not invariant across cultures; that is, the effects of job characteristics depend on context as defined in complex, multifaceted ways.

2.3.2. Work design and inequality. The previous section highlights another significant issue in the relationship between the evolving economic context and work design. A theme that is underrepresented in psychological and organizational behavior studies (if we exclude some research in the field of humanitarian psychology) but receives significant attention at the socioeconomic and political levels is the growing trend of inequalities within populations (Chancel & Piketty 2021). These inequalities are closely linked to work experiences and encompass not only aspects such as employment status, wage level, and job stability but also the quality of work (and how it is designed). For example, Holman & Rafferty (2018) examine the convergence and divergence (i.e., whether inequalities are increasing or decreasing in working conditions) of job discretion over time. They compared different groups of workers based on routine-biased technical change theory (RBTC), which states that digitization decreases job opportunities for workers with routine task competencies but increases opportunities for workers with nonroutine task competencies (Goos et al. 2014). The authors found that there was a general decrease in job discretion over time, but the decline was more pronounced in routine clerical occupations, causing them to become increasingly distinct from nonroutine clerical occupations. Additionally, the decline was faster in continental, liberal, and southern European regimes compared with the social democratic

Scandinavian regimes, where there is a longer and more established tradition of industrial democracy (Guest et al. 2022). However, Lopes & Calapez (2021), using European data from 2005 to 2015 covering 22 countries, found no evidence of a generalized polarization of jobs due to digitization and instead suggest that job polarization may be caused by the devaluation of jobs lower in the occupational hierarchy. In short, job polarization is the result of both new technologies and organizational choices on how work is designed and valued. This highlights the importance of work design at the organizational level as a factor that can affect job polarization and the amplification of inequalities in the quality of work.

2.3.3. Work design and public policies. The multilevel approach described in this section highlights the strong connection between work design and quality of working life (QWL). As emphasized by Grote & Guest (2017), work design and redesign, which are multilevel processes involving contextual factors, managerial decisions, and the agentic role of employees, are essential parts of QWL. However, they note that to succeed, a QWL approach to work design should account for the broader context that drives organizational life. It should also address whether management allows employee autonomy and participation in work design and should understand the importance of autonomy to worker well-being.

In addition, external institutional support is also crucial for the widespread adoption and sustainability of QWL (Guest et al. 2022, Warhurst & Knox 2022). For instance, government interventions that establish minimum job quality standards can play a role. Public interventions that encourage organizations to improve working conditions through incentives can also contribute. International organizations such as the International Labour Organization (ILO) and the Organization for Economic Co-operation and Development (OECD), which focus on promoting decent and fair work, can also have an impact (OECD 2018). These distal factors can influence organizational culture, managerial decision-making processes, and employee attitudes and behaviors, ultimately shaping work design and redesign (Parker & Jorritsma 2021).

As noted by Parker & Jorritsma (2021), well-designed work has important policy implications as it brings benefits to everyone: improved attraction, retention, performance, and safety in the organizations; increased commitment and innovation of employees; and a cascading effect on families, communities, and the entire economy. As an example, Achdut & Stier (2021) have emphasized that in a sample of Israeli single mothers receiving welfare benefits, the decision to leave welfare and seek employment depends on nonmonetary work characteristics above and beyond the salary, such as the ability to use one's skills.

3. WORK DESIGN CHALLENGES

3.1. Work Design Challenges Related to Technology

The rapid recent development of AI technologies has influenced the world of work (Raisch & Krakowski 2021).

3.1.1. New technology in the new economy. Improvements in hardware (e.g., tools for ubiquitous computing) and in the collection, analysis, and use of data (e.g., big data and AI) have led to a more digitalized workplace. Smart technology, AI, robotics, and algorithms (STARA) (Brougham & Haar 2018) have an increasingly significant role in supplementing or replacing human labor. As Cascio & Montealegre (2016) note, the adoption of information technology (IT) sensors (e.g., identification tags, wearable technology, and smartwatches) and other devices allows for the creation of a ubiquitous computing environment at work. Many of today's workplaces are hyperconnected and saturated with data that can be checked from anywhere and at any time; there is also a greater possibility of constant monitoring and regulation of one's activities and loss

of privacy, with work tools engendering new models of work organization (Jatobá et al. 2023). There are impacts on personnel evaluation and reward mechanisms. It is now easier to operate remotely, outside of a set working space (e.g., factory or office) and work hours, and job activities are now mediated by technologies. Thus, the contamination between work and other life domains is exacerbated. Furthermore, AI and automation are eliminating some jobs, increasing the risks of unemployment, underemployment, and social marginalization of some sectors of the population, such as people with fewer professional skills (Kolade & Owoseni 2022). There are also significant consequences for white-collar workers. Consider the transformation of work in the insurance, banking, commerce, and hospitality industries and the resulting impact on employment. Automation and digitalization also affect middle management, whose skills are now embeddable within technologies, for example, to support managerial decisions (e-leadership), screening activities (e-recruitment), personnel selection (e-selection), and training activities (e-learning) (Hertel et al. 2017, *Soc. Ind. Organ. Psychol.* 2023).

Sophisticated technologies for data collection, visualization, and analysis allow for an exponential increase in the organizational data that can be used for decision making, HR management, and work design (Fauzi et al. 2022, Oswald et al. 2020, Putka & Oswald 2016). The availability of these high-volume, high-velocity data has facilitated the adoption of big data analytics in HR functions.

Although algorithms and AI appear to provide rational, objective, and impersonal decisions, these tools may be subject to systematic biases that perpetuate stereotypes and discrimination (e.g., based on gender or race) due to their being trained on past biased decisions (Pethig & Kroenung 2022). Notably, the integration and interdependence between human work and digital technologies will intensify the need for work design focused on how jobs, tasks, work, and technologies are integrated (Parker & Grote 2022).

3.1.2. Artificial intelligence and algorithmic management: an emerging work context.

This technological revolution with work governed by AI and algorithms has accelerated with the emergence of the gig economy. The result is a service production system based mainly on IT platforms that connect the producers of goods and services with customers. This creates a new form of work in which independent workers function through digital platforms, not managers, to provide on-demand services to customers (Duggan et al. 2020). The gig economy represents a significant shift toward highly autonomous (and stressful) work, based on temporary contracts, extreme flexibility in working hours, weak ties with human supervisors, and management based on algorithms that regulate interactions through apps or other IT communication systems (Baldwin 2019, Jabagi et al. 2019). However, AI and algorithmic management do not only concern the gig economy; they are part of a management model that is expanding to other worker sectors, including white-collar jobs. More recently, it has been applied to conventional service sectors such as healthcare, financial services, and policing (Kellogg et al. 2020). Furthermore, technology-mediated employment has become more common due to the acceleration in remote work caused by the pandemic.

3.1.3. Artificial intelligence, algorithmic management, and their impact on work design.

AI in HR management refers to the use of technologies such as machine learning and cognitive computing to automate HR processes and functions. It involves computer-based algorithms to analyze large volumes of data, identify patterns and trends, and make predictions and recommendations that can support HR professionals in decision making and improve efficiency and effectiveness of HR processes (Pan & Froese 2023). Algorithmic management, as a product of AI, denotes a system in which computer-programmed procedures are used for the execution and control of HR tasks (Cheng & Hackett 2021, Duggan et al. 2020). Algorithms aimed at personnel management can be descriptive, which involves analyzing records of past events; predictive, which involves predicting future events or estimating the probability of their occurrence; or

prescriptive, which involves recommending a course of action (Parent-Rochelleau & Parker 2022). The most widespread use of algorithmic management is found in the gig economy. For example, food delivery workers receive instructions through an app regarding work allocation, where to collect and drop off products, the route they should take, and their compensation.

Relevant to this article, the reviews by Kellogg et al. (2020) and Parent-Rochelleau & Parker (2022) reflect how algorithmic management, as an instrument of control, significantly impacts work design and differs from traditional bureaucratic and technological control. These reviews also provide guidance on designing digitalized work in the future. Kellogg et al. (2020) identified six main mechanisms (the six Rs: recommending, restricting, recording, rating, replacing, and rewarding) that organizations can use to direct, evaluate, and discipline workers through algorithmic control. **Table 2** summarizes Kellogg and colleagues' conceptual framework and, in the last columns, reports the main impacts on work design.

3.1.4. Designing work for algorithmic control. The impact of algorithmic management on work design appears to be largely negative. As noted by Parent-Rochelleau & Parker (2022, p. 2): “Existing research on algorithmic management tends to suggest that it generates more negative than positive outcomes for workers. In particular, algorithmic management has been associated with a reduction of workers’ autonomy. . . and the creation of power asymmetry in information availability.” Specifically, Parent-Rochelleau & Parker (2022) use the job demands–resources model (Bakker et al. 2023) to illustrate the risk that algorithmic management could lead to a reduction of resources (e.g., autonomy, task variety, social support, and task complexity) available to workers. At the same time, there may be a general tightening of job demands (i.e., workloads, work intensity, job insecurity, and constant surveillance). However, Parent-Rochelleau & Parker (2022) note that the negative consequences of new technologies can be minimized through the design and implementation of algorithms and technological solutions, specifically, system transparency, system fairness, and human influence. System transparency, or the degree to which explanations are provided for why and how algorithmic management is used, should lead to an improvement in the sense of autonomy of workers. System fairness, or the accuracy and appropriateness of the decision-making process, the lack of discrimination, and the legitimacy of the criteria used by the system to manage HR, should lead to increased trust in feedback from the job and the meaning of work. Human influence, or putting people in the loop of algorithmic decision making, means giving voice to and encouraging the contribution of workers in the design and control of technological systems and providing the possibility to opt out of the system. Human influence can foster autonomy, task significance, and job complexity. It can also mitigate the negative experiences of loss of control over one’s work and job insecurity. The challenge, however, is understanding how transparency, fairness, and human influence are implemented in and communicated by organizations and actually experienced on the ground by different system users. For example, there may be different perceptions and understandings of these three elements among employees and between employees and management. These perceptions may also differ across professions, demographic groups, and organizational and national cultures.

3.2. Work Design and Workplace Diversity in the New Economy

The workforce has become increasingly diverse, an issue generally unrecognized in the work design literature. In this section, we discuss the implications of age, disability, gender and sexual orientation, and race/ethnicity for job design.

3.2.1. Diversity and inclusion challenges. Global demographic trends (e.g., migration of employers and employees, rising life expectancies and extended working lives, and increasing

Table 2 The algorithmic mechanisms and their potential impact on work design^a

Action	Algorithmic mechanism	Technological contribution	Algorithmic control processes	Work design impact	
				Job characteristic losses	Job characteristic gains
Direct	Recommending	Prompt workers to decide between specific courses of action preferred by the platform.	Operator's actions and decision-making power are constrained. Opaque and unfair recommendations can lead to frustration.	Autonomy, task variety	Workload
	Restricting	Restrict access to information; sequential microtasks.	Job complexity, autonomous information processing, decision making, and job meaningfulness are reduced.	Information processing, job complexity, task identity, role clarity, job meaningfulness	NA
Evaluate	Recording	Record the behavior and statistics of workers to provide real-time feedback.	Constant surveillance and feedback may be a source of stress and a breach of privacy but may also adequately adjust performance in real time.	Feedback from others, workload	Feedback from the job
	Rating	Translate internal and external data into summary performance measures, online ratings, and predictive analytics.	Evaluation algorithms may create feelings of injustice, eliminate the social support and feedback from interpersonal performance evaluations, and encourage working for data or gaming the system.	Social support	Interaction outside the organization
Discipline	Replacing	High turnover due to lack of legal protection for the automatic replacement of low-qualified workers and freelancers.	Working conditions are less protected, and workers have less influence in the increase of work and in the firing process.	NA	Work conditions (job insecurity), physical demands, workload
	Rewarding	Performance recognition (i.e., bonuses), piece-rate compensation, and gamification to incentivize workers.	Recognition can be motivational and include greater flexibility and autonomy but may lead to taking on more work.	Work conditions	Autonomy

^aThe table integrates the Kellogg et al. (2020) and Parent-Rocheleau & Parker (2022) models and job design concepts. Abbreviation: NA, not applicable.

representation of women in the workplace) and today's global economy (e.g., increasing international, multinational, and global companies) make diversity and inclusion a top priority and one of the most important challenges for the labor market and organizations worldwide (Mor Barak 2022). This increased workforce heterogeneity brings both threats (e.g., discrimination can be damaging and expensive for businesses) and opportunities (e.g., successful management of diversity can produce relevant rewards for businesses) for employers, highlighting the need to find ways to value the contributions and accommodate the needs and preferences of an increasingly diverse workforce. In short, diversity is part of the new economy.

Research shows that minorities and/or individuals belonging to nonmainstream social categories (e.g., gender, race/ethnicity, age, sexual orientation, physical or mental disability) are still facing discrimination at work, such as exclusion from job opportunities, career advancement, decision-making processes, and access to information and resources (Jones et al. 2016, Mor Barak 2005). In light of this research, ongoing efforts have been made to develop and implement antidiscrimination legislation for the containment of work-related exclusion processes of historically disadvantaged groups. However, many countries have yet to define and implement such legislation, and those that have do not always consider the protection of all marginalized groups (Cleveland et al. 2018, Mor Barak 2022). Moreover, due to the increasing requests for equal rights, diversity, and inclusion, scholars and practitioners emphasize the need to implement active strategies, policies, and practices to remove barriers that hinder the full participation of all employees (Holvino et al. 2004, Shore et al. 2018). We argue that work design can be an important organizational practice in helping to achieve this result and enhancing the inclusion, well-being, and effectiveness of a diverse workforce.

On the one hand, research investigating differences in work design–related (e.g., job characteristics) preferences and needs among individuals in specific marginalized categories (e.g., age, gender, race/ethnicity, sexual orientation, physical or mental disability) is still quite limited. Indeed, apart from a few recent studies on the interaction of job characteristics and age on work-related outcomes, our review uncovered limited research addressing these issues for other marginalized categories. On the other hand, there is strong evidence for the existence of stereotypes and discrimination against specific groups in the workplace. This has repercussions for work design because the selection of people for certain jobs may be made incorrectly based on stereotypical assumptions [e.g., that science, technology, engineering, and mathematics (STEM) jobs are for men and not for women]. Moreover, the person chosen for the job affects the crafting of the job (e.g., some jobs in technology would change if more women were included in them). These are key issues for work design scholars and practitioners and underscore the compelling need for research on how to design work that successfully includes and values a diverse workforce.

3.2.2. Age. The global workforce is becoming more age diverse, with a continued increase of the presence of older workers but with strong variability between different geographical areas. Individual and contextual factors (e.g., the COVID-19 pandemic and retirement plans) heavily influence decisions on remaining in or reentering the workforce. However, research shows that older workers may face stereotypes and discrimination resulting in difficulties with reentering the job market after a layoff, being selected for job interviews, and being promoted (Cadiz et al. 2022, Zaniboni et al. 2019). While there may be individual differences tied to job-relevant KSAOs that covary with age (particularly physically demanding ones), evidence that an older worker may have a poorer job performance compared with a younger one is limited (e.g., Ng & Feldman 2008). Work design research aiming to understand whether the characteristics of a job are a better fit for older and younger workers (i.e., improving motivation, performance, and well-being) may be the key for organizations to fully include and utilize an age-diverse workforce.

Truxillo et al. (2012) proposed a model that suggests that job characteristics may be differentially beneficial, depending on the age of the workers. Specifically, based on Morgeson & Humphrey's (2006) model of job characteristics and on life-span development theories (i.e., selection, optimization, and compensation theory and socioemotional selectivity theory), they suggested that job characteristics will interact with age in affecting work-related outcomes, such as attitudes, behavior, and well-being (Truxillo et al. 2012).

Empirical studies that tested the theoretical assumptions proposed by Truxillo and colleagues' model (e.g., Fazi et al. 2019; Zacher & Schmitt 2016; Zaniboni et al. 2013, 2014, 2016) and earlier studies (e.g., Shultz et al. 2010, Zacher & Frese 2011) support the assumption that younger and older workers can benefit from different work characteristics. However, research is still limited, and only a few work characteristics have been studied (e.g., skill and task variety, autonomy, and social characteristics). For example, older workers may benefit from the ability to apply their accumulated skills, and younger workers may benefit from performing more tasks, which would allow them to accumulate the needed work experience (Zacher et al. 2017; Zaniboni et al. 2013, 2014). Other research shows that autonomy is especially beneficial for older workers, increasing their satisfaction and, through this, leading to better mental health, allowing them to adapt to the different demands from the job and compensate for potential age-related limitations and losses (Zaniboni et al. 2016). However, other research found mixed results, suggesting that the specific outcomes considered may also play an important role (Ng & Feldman 2015, Zacher et al. 2017) and that moderators may be at play. For example, with regard to job attraction, job autonomy may be more important for younger workers since they may pay more attention to what makes a new job challenging and interesting (Zacher et al. 2017). Considering social characteristics of work, studies have found interaction outside the organization and interdependence to be differently beneficial for older and younger workers (Fazi et al. 2019). Specifically, research shows that younger workers benefit more from interaction outside the organization since they are more future oriented and more interested in challenging social interactions at work, whereas older workers benefit more from interdependence since they are more present oriented and daily interactions with colleagues are more emotionally rewarding for them (Fazi et al. 2019).

3.2.3. Disability. The work environment should be designed and adapted to make work feasible for persons with disabilities, whose workforce participation is increasing. While physical disabilities may be challenging for employment and research is still needed in finding ways to accommodate the needs of workers with physical disabilities (Nevala-Puranen et al. 1999), people with mental disabilities face more barriers, stigma, and discrimination regarding work participation (Nigatu et al. 2017). This has important consequences for societies and organizations and for people with mental disorders, given that work is critical for recovery and facilitating social integration. Furthermore, the cost of unemployment, sickness absence, and reduced productivity because of mental health problems is substantial (Corbière et al. 2011, Villotti et al. 2015).

Therefore, helping people with mental disorders gain and/or maintain employment is important. The understanding of key work design issues (i.e., work-related physical and psychosocial design factors) may play an essential role in facilitating or hindering this process (e.g., Halonen et al. 2020). Indeed, research on physical dimensions of work and workers' mental health shows that repeated movements, workload, workplace hazards, and work schedule may negatively impact their opportunities to maintain the job (e.g., Halonen et al. 2020, Lahelma et al. 2012). Furthermore, research on psychosocial work factors shows a negative relation between job demands and workers' mental health (e.g., Kouvonen et al. 2016, Urbanetto et al. 2013), whereas social support helps not only the development of good mental health but also the return to work (Hiilamo et al. 2019, Lau et al. 2019).

Moreover, research is starting to show the effects of the intersection of age, work design, and disability due to mental disorders, such as age-related differences in the impact of physical and psychosocial work aspects on employees with mental disorders. For example, working overtime seems to be one of the major causes of mental health deterioration in young workers (Law et al. 2020), and working night shifts seems to be particularly harmful for mental health decline in older workers (e.g., Olinto et al. 2017). Social support from colleagues and supervisors may be particularly important for mental health outcomes in middle-aged and older workers (e.g., Laine et al. 2014). An important avenue for future research may be understanding the role of AI technologies and/or remote work in helping workers with disabilities.

3.2.4. Gender and sexual orientation. Gender discrimination (i.e., unfair treatment because of gender) and gender segregation (i.e., the tendency for women and men to work in different occupations) are well-known issues in certain occupations and industries (Charlesworth & Banaji 2019, Cortes & Pan 2017). Gender is a primary feature in evaluating a person, and even if it is known and recognized as a nonbinary category (e.g., gender blending), we have a tendency to compare and contrast women with men and vice versa (Ellemers 2018). Research shows that gender stereotypes are consciously and/or unconsciously applied in evaluating task performance for men (agency-oriented expectations, prioritizing competence and power) and social relationships for women (communion-oriented expectations, prioritizing social aspects such as warmth and care) (e.g., Ellemers 2018). Indeed, competence and warmth are fundamental dimensions of stereotypes, frequently used to build expectations and predictions regarding the behavior of people (e.g., men and women) (Fiske & Taylor 2010). Extended research shows that gender-stereotypical expectations (e.g., men as economic providers and women as homemakers) influence the way we judge the performance and the ability of women and men, penalizing primarily women in regard to work-related issues, such as occupational choices, career opportunities, type of job held, pay and bonuses, and promotion in prestigious positions (e.g., Joshi et al. 2015). This has important repercussions for work design, since jobs traditionally done by women may be characterized by fewer intrinsic and extrinsic rewards and less enriching content (Diekmann et al. 2019, Llorens et al. 2021). It may also funnel men and women into jobs with different characteristics.

Sexual minorities also encounter discrimination in the labor market (Mize 2016). Research shows that sexual minorities (e.g., persons belonging to the LGBTQI+ community) face stereotypical assumptions of being less competent compared to heterosexual and cisgender individuals, negatively affecting selection processes and hiring decisions (Flage 2019, McFadden 2020). Moreover, research results also point to a wage gap associated with minority sexual orientation and gender identification (e.g., Plug & Berkhout 2004, Preston et al. 2019), higher risk of bullying and harassment at work, and lower job satisfaction than heterosexual and cisgender individuals (Valfort 2017). In general, workplace research on sexual minorities has only just begun, and research specifically in work design aspects is missing.

Work design practices that properly address the real needs and preferences of workers of different genders and sexual orientations may not only create a better fit with job characteristics (e.g., family needs and flexible/remote work) but also limit the stereotype-based workplace decisions in this regard, which penalize not only workers but also teams, organizations, and societies (e.g., creating social, physical, and psychological job environments that block the full potential of a more diverse workforce).

3.2.5. Race/ethnicity. The persistence of racial discrimination and exclusion in the workplace has been well documented (Zschirnt & Ruedin 2016). While the levels of work-related discrimination against ethnic and racial minorities may vary across nations and labor markets, research consistently shows negative effects on multiple outcomes such as hiring opportunities and

promotions, type of job held, pay (e.g., Stainback et al. 2018, Wingfield & Chavez 2020), and physical and mental health (e.g., Chavez et al. 2015).

Moreover, research on the intersection of race and gender in workplace discrimination shows that employees who belong to two or more underrepresented categories (e.g., Black women) may have the worst outcomes in terms of workplace discrimination (Browne & Misra 2003, Melaku 2019). However, a recent meta-analysis did not show a systematic effect in the intersection of race and gender, suggesting a more complex picture that may depend on multiple factors, such as the characteristics of the specific job (Zschirnt & Ruedin 2016). In line with this finding, Di Stasio & Larsen's (2020) research on hiring discrimination in five European countries focused on the intersection of gender and race. It showed an effect related to the extent of the congruence with feminine or masculine traits of the job. For example, in male-typed jobs, Black and Middle Eastern men may encounter the strongest ethnic discrimination, and, independently from the gender composition of the occupation, Black women may experience more discrimination than White women. As we emphasize in Section 4, more research is needed in understanding the effects of cumulative disadvantages across multiple/intersectional identities.

3.2.6. Summary. We have discussed the work-related challenges that people belonging to certain social categories are facing. We have also presented the risks associated with making key work-related decisions relying on social expectations based on stereotypes and prejudice rather than on the different needs and preferences of individuals. Studies on age are starting to explain how jobs may be designed to address the needs and preferences of different workers, although this job design research has not been extended to other demographic categories. Although we do not yet know a lot about demographic effects on job design, considering diversity in job design is the right thing to do given increased workforce diversity, and it will affect inclusion, hiring, and who crafts a given job (Strah & Rupp 2022).

3.3. Work Design Challenges Related to New Features of Work

New technology and workplace diversity are important issues for work design. In addition, new forms of work, such as uncertainty and gig work, may be important for how we conceptualize job design.



3.3.1. Uncertainty and job insecurity. Perhaps the most certain prediction is that high levels of uncertainty will pervade the new economy and workers' experience of it. As an example, a lesson from the COVID-19 pandemic is that large shocks in the broader context can affect the workplace in meaningful ways. Event system theory (EST) (Morgeson et al. 2015) provides a useful framework for understanding the effects of contextual events on organizational process at multiple levels. Specifically, EST argues that events (e.g., the pandemic) become salient when they are novel, disruptive, and critical, and that these events can change organizational behaviors and features. The event and its effects often change and unfold over time with effects at multiple organizational levels. An example of such an event would be the changes in work patterns precipitated by a natural disaster in a local region and its lasting repercussions within the organization. For example, McCarthy et al. (2021) used EST as a lens for examining how COVID-19 deaths in a particular region could affect a very micro phenomenon such as job applicants' reactions. Clearly, the pandemic also changed how work is carried out (face-to-face or online), where people work, and how work affects nonwork life, with both positive and negative outcomes. Workers and organizations adapted to the shock produced in the broader environment. Although some of these changes to work (e.g., working from home) were intentional, their long-term adoption by workers

was likely not intended by many employers. In short, there can be consequences across levels with both intended and unintended outcomes.

Given the anticipated significant shocks that are already predicted to occur in the coming decades (e.g., climate change and technological change) and those that are unpredictable (e.g., pandemics and natural disasters), workers will need to develop a high degree of adaptability. For example, the effects of climate change will likely force workers to adapt not only in their work lives but in their home lives as well (e.g., needing to change their geographical location or patterns of work). For instance, changes made at higher organizational levels to mitigate climate change (e.g., work location) can have both intended (e.g., reduced travel and commuting) and unintended (e.g., workers refusing to work evenings and weekends to further differentiate work and home) consequences for the way workers perform their jobs. At the same time, technological changes in the new economy will require from workers a level of adaptation not seen since the industrial revolution. Robotization and the use of AI will eliminate entire jobs or will change them in ways that will make them nearly unrecognizable, requiring upskilling and lifelong learning as a consistent adaptation required of most workers. It will also require new sorts of interpersonal and teamwork skills, with work relationships developing not only face-to-face or virtually but sometimes through both types of interaction. This will require a high degree of flexibility in supervisors to successfully manage teams under these conditions. Furthermore, a green economy will produce a raft of new jobs with new job requirements and training (Pozniak 2021).

In addition, given the changing nature of jobs in terms of new required skills or the complete elimination of some jobs, workers will need to cope with a high level of job insecurity. Furthermore, relatively new concepts such as universal basic income [in which all people within a community receive some sort of basic salary regardless of need (e.g., Bidanure 2019)] may help alleviate this insecurity in terms of income. However, it could also act as a shocking event according to EST, potentially dismantling the meaning of work and changing people's identity and relationship with work.

3.3.2. New social relationships: gig work, self-management, and always-on culture.

As mentioned above, new forms of work are supported by algorithmic management (Parent-Rochelleau & Parker 2022). Gig work in many parts of the world is a macroeconomic trend that may result in difficult working conditions (e.g., O'Shea et al. 2024). While some forms of gig work allow greater flexibility and control to some workers (e.g., some types of freelance workers such as graphic designers, photographers, web content creators, translators, and journalists), other types of gig workers (e.g., drivers for ride-hailing services, food delivery workers, and some home repair workers) may have much of their work mediated by an algorithm, with no supervisor at all. This high level of autonomy, normally considered highly desirable, makes the worker always on. It means that workers are being constantly evaluated in terms of their work quality, and often their evaluation may be at the mercy of a difficult or capricious customer. Other types of gig work may include situations where workers are in constantly changing teams and environments.

3.3.3. Job sustainability/decent work.

The importance of decent work to health and well-being is increasingly recognized (e.g., Blustein et al. 2023). For instance, precarious work, characterized by instability, temporariness, and often low pay, has been increasing in many countries in recent years, partly due to global economic changes that provide flexibility to employers. It has had particularly negative impacts on workers at lower economic levels. Such precarity is associated with negative health outcomes for workers, families, and communities (Benach et al. 2014, Vanroelen et al. 2021). Furthermore, precarious work runs counter to the United Nations' Sustainable Development Goals (SDGs), particularly SDG8, focused on promoting both decent work and economic growth, an important challenge for organizations within the new economy.

Furthermore, SDG8 is consistent with the United Nations' call for a green economy, with a focus on being low carbon, socially inclusive, and resource efficient, creating a new focus for employment, skills, the economy, and environmental outcomes. The balance is to maintain work that is both decent and sustainable for the worker and the employer [e.g., that maintains both worker performance and well-being (Tordera et al. 2020)].

3.3.4. Job crafting/job adaptivity. Given these changes in the landscape of the new economy, it would be logical to assume that many decisions regarding job redesign will continue to be made from the top down in organizations to leverage a given technology. However, we know from past history that making such technical changes without considering how to fit them to the needs of the employee and the team (e.g., Trist & Bamforth 1951) can have negative consequences. More recently, scholars have argued that these lessons about technology and human systems still apply, particularly in the face of today's significant job redesign (e.g., Guest et al. 2022). Taking both technical needs and individual and social needs into account will help make these jobs sustainable for the employees in terms of long-term productivity and well-being. Thus, the employee's experience of the job will also need to be considered. For example, Parent-Rocheleau & Parker (2022) expect that a number of employee outcomes (e.g., job insecurity) will be negatively affected if employees are given little input or transparency. Other authors (Morgeson et al. 2010) note that characteristics of the occupation (e.g., the similarity between the individual and the occupation) and of the organization (e.g., organizational culture) likely play a role in a person's experience of the job. For these reasons, employees' job crafting as well as their adaptability will be a central part of their work and career success. Events in the external environment as well as technological changes within organizations will also require that workers craft their jobs to make them more congruent with employee needs and therefore more sustainable.

4. FUTURE DIRECTIONS FOR RESEARCH AND PRACTICE

In this section, we summarize future research and practical applications related to the development of work design in organizations by considering our three main pillars: new technologies, diversity, and new features of work.

4.1. Future Research

The future research directions we have identified are organized according to the classification summarized in **Table 3**.

4.1.1. New technologies: relational work design. Although some studies have already explored the relational dynamics in jobs regulated by digital tools, as suggested by other authors (e.g., Kellogg et al. 2020, Parent-Rocheleau & Parker 2022), there is still much to research. A traditional, critical component of human work is at stake here: its social and relational features. What effects will the reduction of relationships at work (e.g., superiors, colleagues, and customers) have in the medium to long term? Studies on work stress have clearly confirmed the role of social support as a resource for coping with work demands. What happens in terms of stress if this resource is lacking or its presence is reduced in favor of automated feedback and support? More specifically, how do people who are managed by automatic systems (fully or partially) react to a reduction in empathic relationships? How do they deal with situations where negotiations and human contact are partially or fully replaced by algorithmic systems? From this perspective, ethnographic studies are needed to identify how digital workers will replace these social ties with colleagues, customers, and managers.



Table 3 Questions for future research on **job** design in the new economy

Category of change	Questions to consider
New technologies and relational work design	What are the effects (e.g., increased stress from lack of support) of reduced work relationships (e.g., with superiors, colleagues, and/or customers)? How do people react to totally or partially automated management?
New technologies: opacity issues	Which entity (e.g., manager or algorithm) appropriately makes high-stakes decisions (e.g., for promotions) for workers? What do workers understand about the workings of digital systems (e.g., the control they or their supervisors have)? What are the effects of opacity on workers (e.g., frustration, stress, and unfairness)? What interventions reduce opacity and increase employee acceptance of new technologies?
New technologies: resistance to algorithmic control	What contextual (e.g., organizational) and individual factors lead to rejection of digitized practices? How is this rejection manifested at work (e.g., counterproductive work behavior)?
Workforce diversity	What job conditions activate workplace stereotypes and discrimination? What strategies can reduce stereotypes and discrimination at the individual, group, organizational, and societal levels? How does diversity affect the design of jobs? How can we design jobs that accommodate the needs and preferences of a diverse workforce? What is the relation between intersectional identities and work design?
Uncertainty and job insecurity	What are the cascading effects of shocks (e.g., pandemics, natural disasters, technological change, and migration) at different levels—individual, team, organizational? How do these shocks play out over time? How can organizations and society support job security and reduce uncertainty (e.g., promote lifelong learning and adaptation)? How can organizations develop leaders to successfully design and use multiple modalities (e.g., face-to-face, technology mediated, or a combination) to manage teams? How can society support transitions from current forms of work to profoundly different forms, including its elimination?
Gig work, self-management, and always-on culture	Under what conditions is algorithmic work experienced positively by employees? How does this affect their productivity and well-being? How can we support employees working in such conditions?
Job and career sustainability/decent work	How can we support a world economy that equitably balances growth across countries, employment sectors, and socioeconomic levels? What constitutes decent work to different workers in different contexts?
New features of work: job crafting/job adaptivity	How can organizations help workers adapt to workplace changes via job crafting? How can workers help organizations successfully redesign jobs?

4.1.2. New technologies: opacity issues. Another important issue is the opacity that characterizes many platforms and performance management mechanisms. This affects task division, who is given responsibility for certain decisions, and which criteria are used to evaluate and reward people. This opacity has a significant impact on the perception of meaningfulness and control over one’s work and may affect performance, well-being, and privacy perceptions. Research is needed on employees’ understanding of the workings of digital systems, (e.g., How much control do they or their supervisors have?). How does the opacity of operations encourage forms of passivity and frustration? What impact does it have on people’s professional identity? An important question is the extent to which interventions regarding system transparency can reduce opacity and improve employee acceptance.

4.1.3. New technologies: resistance to algorithmic control. A third, emerging area of research involves algoactivism, the individual and collective resistance to algorithmic control

(Kellogg et al. 2020). Algoactivism is relevant to research on counterproductive work behaviors and behavioral reactions because many workers do not accept algorithms for controlling their work design. What are the organizational and individual factors that predispose acceptance or rejection of digitized practices for human work control? Can new forms of conflict dynamics be identified in the workplace due to this lack of acceptance? What is the role of unions in this issue?

4.1.4. Workforce diversity: stereotypes and discrimination. Research shows the negative impact of stereotypes, stigma, and discrimination in work-related outcomes (e.g., exclusion from job opportunities, career advancement, decision-making processes, and information and resources) for people not belonging to dominant social categories. However, it is still not entirely clear under which specific conditions and processes explicit and implicit stereotypes may be activated in the workplace, and future research is needed in this direction (e.g., Cadiz et al. 2022). Moreover, significant research is still needed in identifying actions and strategies that may efficiently manage these conditions and reduce their impact at multiple levels (i.e., individual, group, organizational, and societal). For example, research is needed on unconscious bias interventions at multiple organizational levels and over time.

Acknowledging the existence of stereotypes and their negative outcomes is the first step in identifying and correcting them. Thus, the increasing diversity of the workforce calls for training and interventions to help managers design jobs that fit different employees. However, algorithms have also perpetuated significant discrimination because their learning is based on past, discriminatory decisions. Therefore, organizations should strategically identify the ways in which algorithms may influence organizational decisions related to work design, including the ways that algorithms may unintentionally design work in ways that are relevant to past employees (e.g., male) but not necessarily to current workforces (e.g., gender diverse).

4.1.5. Workforce diversity: designing work from the bottom up and the need to understand real differences. Thus far, except in the field of aging, empirical studies on the interplay between diversity and job characteristics are scarce. Research on these issues is needed in order to design jobs that accommodate the needs and preferences of all workers and to properly and fully include an increasingly diverse workforce. Such knowledge is essential for HR practitioners, managers, and employers to make data-driven decisions, overcoming the barriers of stereotypes, stigma, and discrimination, and to implement work design interventions that allow all individuals to successfully be part of the workforce, with positive implications for people, organizations, and societies. Research is also needed to understand how people with different backgrounds, characteristics, and needs successfully adapt their work—intentionally, unintentionally, or even unconsciously—to their needs and preferences.

4.1.6. Workforce diversity: the intersectionality issue. As the workforce becomes increasingly diverse, employees increasingly possess complex identities across multiple demographic categories. However, research is only beginning to show the complexity of this intersectionality and its outcomes (e.g., Hall et al. 2019). Because diversity at work is manifested in multifaceted demographic categories, future research is needed to understand the complexity of intersectional identities and their impact on work design. Although past research was hampered by relatively small studies, we anticipate that large, complex data sets (big data) becoming more available in organizations will help to tackle this research area.

This issue has strong implications for practice. HR practitioners and organizations have just started to acknowledge that workers may simultaneously be members of multiple demographic categories, and the implications related to this are relatively unknown (e.g., how organizational decision makers make sense of and interpret this mix of employee characteristics). Therefore, to

succeed in the new economy, effective work design practices need to take this intersectionality into account; the success of these practices will depend on undertaking research (noted above) to understand the issues and mechanisms involved.

4.1.7. New features of work: uncertainty and job insecurity. Our discussion of the new economy poses a number of research questions, including those related to worker uncertainty and job insecurity. The first is to examine the cascading effects of shocks at different levels—individual, team, and organizational—and how these play out over time (Morgeson et al. 2015). The second is to examine how cumulative events and shocks such as technological change, pandemics, or migration patterns affect organizational processes. For example, in the case of COVID-19, advances that had been made in online technology facilitated people working from home, and, in fact, the pandemic likely accelerated the technology itself. The third question is what organizations and societies can do to support lifelong learning and adaptation on the part of workers, many of whom may lack confidence or be unwilling or unable to take on such learning. The fourth is to examine how organizations can source or develop leaders who are comfortable with managing ever-changing teams using multiple modalities (face-to-face, technology mediated, or some combination). The fifth is to consider what types of interventions can be developed on the basis of sound science to support workers in this changing, unstable environment. Finally, a key question for the individual and society is how to support a successful transition from current forms to profoundly different versions of work—including perhaps its partial elimination—in industrialized societies.

4.1.8. New features of work: gig work, self-management, and always-on culture. Key questions regarding gig work are when and by whom it is viewed negatively or positively. For example, O’Shea et al. (2024) argue that gig work that is done by choice or as a short-term economic solution is likely to be experienced more positively by the employee than when there are no other choices. A similar point is made by Parent-Rocheleau & Parker (2022) in their review; they found that algorithmically managed work is experienced more positively when employees understand the workings of the algorithm and have some voice in the process. We argue that future research should address under what conditions algorithmically managed work is and is not experienced positively by employees, how it affects their outcomes (e.g., productivity and well-being), and what can be done to support employees working in these conditions.

4.1.9. New features of work: job sustainability/decent work. The balance of both decent and sustainable growth within the new economy is arguably critical to the planet but also brings challenges to employers. We see two avenues for future research. First, how can we support a world economy that equitably balances growth across countries, employment sectors, and socioeconomic levels? This question goes beyond typical job design issues and includes significant economic and political factors as well. It also includes equity across developed and developing countries. Second, consider what decent work means to different workers in different countries. For example, work arrangements considered precarious in some economies may be a positive, temporary path to a stable economic foothold for workers in other settings.

4.1.10. New features of work: job crafting/job adaptivity. Although past reviews (e.g., Parent-Rocheleau & Parker 2022) have suggested some important factors that can affect the intersection of the new economy and the individual employee, far more research is needed. Perhaps the key question is how employers can be responsive to worker needs in adapting to these changes, as well as gaining input from workers on how to make redesigned jobs more sustainable to the employee. For example, Lin et al. (2021) used EST (Morgeson et al. 2015) to examine the negative

effects of the pandemic on employee outcomes, finding that organizational adaptive practices (i.e., providing disease prevention materials, flexible work hours, telework, and paid leave) buffered the effects of the pandemic on job insecurity. Notably, these factors were also consistent with World Health Organization guidelines. Input about these issues might be gained from individuals, professional associations, national and international health and emergency agencies, and labor unions.

4.2. Implications for Practice

These changes have significant implications for the practice of work analysis and for workplace interventions.

4.2.1. A new focus for work analysis. Often described as a cornerstone of HR, work analysis has played a central role in HR functions from personnel selection (Soc. Ind. Organ. Psychol. 2018) to training and performance management (Morgeson et al. 2020). The term that is used today, work analysis rather than job analysis (Sanchez & Levine 2012), implies the analysis of not only specific, organizationally prescribed worker behaviors and attributes but also the workers' context. It also suggests how workers may act agentically; that is, they may craft their own jobs. In fact, Sanchez & Levine (2012) suggest that rather than seeing job analysis as a tedious operation done merely to identify tasks and KSAOs and carry out other HR functions, it would be useful to integrate work analysis with related concepts such as job design and job crafting as well as strategic change. In our view, the rise of the related topic of competency modeling (e.g., Campion et al. 2011), with its emphasis on broad attributes, clusters of activities beyond tasks, and organizational strategies, suggests a shift away from the narrow, task-focused job analysis of a single job to more meaningful issues in the current organizational environment. In short, job analysis may be used and adapted to determine not only what work is done in the new economy but also how the workers experience that work, how that experience can be improved, and even how workers can be supported to craft their work.

In addition, the ongoing and expected changes to work and the economy—which might include the shortening of work weeks, increased gig work, the elimination of certain types of work, and the need for frequent upskilling for workers to adapt—have implications for work analysis. First, work analysis methods will need to develop taxonomies for critical worker attributes, including adaptability, self-management, and stress management, that may be needed for workers to adapt to the new situation. Second, as hinted at by Sanchez & Levine (2012), a newer approach to work analysis offers the opportunity to understand more than what the worker does and the worker attributes required to do it; it can also be used to better understand the experience of work and how work can be redesigned by the organization and crafted by the workers themselves to lead to improved performance and well-being. Third, work analysis can focus on how the worker can adapt to increasing human-machine (or human-AI) interaction in a postindustrial world; for example, work analysis might focus on which (and how) heretofore human tasks can be most effectively delegated to AI and which should remain within the purview of humans. Fourth, new technology can be used to significantly simplify the time-consuming job analysis process (e.g., multiple surveys of multiple workers); a recent study (Putka et al. 2023) has illustrated how a natural language processing approach can be used to streamline this process. Finally, rather than relying on worker self-reports, new technology can observe what tasks workers actually perform, although we acknowledge that the promise of such approaches could be offset by concerns over worker privacy and employer monitoring.

4.2.2. Workplace interventions. The previous sections highlight the relationship between job characteristics and outcomes such as work performance, motivation, and psychological well-being.

For example, multiple studies show that jobs with higher levels of autonomy, variety, significance, and meaning, as well as regular feedback, are linked to better performance, higher motivation, and greater satisfaction. However, these findings come from cross-sectional and correlational studies that often rely on self-reports of employee perceptions of job characteristics and psychological states (e.g., motivation, satisfaction, and emotions). The true impact of work design and redesign—as objectively measured or implemented—on organizational and individual outcomes can be understood only through the systematic analysis of targeted interventions and the measurement of their results. Despite the lack of strong empirical evidence from quasi-experimental research designs or randomized control trials, some reviews have examined work redesign interventions and practices and their effects on well-being (Daniels et al. 2017) and performance (Knight & Parker 2021). These reviews help illuminate which interventions are most effective and under what conditions, as well as how the causal link between work redesign and individual performance and well-being can be established. We argue that such interventions should be examined within not only traditional work contexts but also contexts emerging in the new economy.

Daniels et al. (2017) analyzed 33 intervention studies that linked job redesign interventions to other employment practices. Although their findings were mixed in terms of traditional job design interventions, training workers to improve their own work design to increase well-being through work quality had the most promising results. In addition, the authors highlighted the importance of a systemwide approach that simultaneously addresses job design enhancements along with other employment practices such as improved selection processes, performance management, and training. Similarly, Knight & Parker (2021) examined the impact of 55 work design interventions on performance, classifying the interventions into five types: (a) job enrichment and enlargement, (b) participative job enrichment and enlargement, (c) relational interventions, (d) autonomous workgroups, and (e) organizational systemwide changes. They noted that types *a*, *b*, and *c* had the greatest effects on performance. The authors also confirmed that work redesign interventions affect employees' perception of work characteristics, which then leads to intrinsic motivation, autonomous response to job demands, and self-development and learning processes, leading to improved performance. Consistent with Daniels et al. (2017), Knight & Parker (2021) found that the most effective job redesign interventions are those that align with changes at the organizational level, with strong management support. Accordingly, they note that when interventions are inconsistent with the organizational culture, not accompanied by simultaneous strategic changes, or implemented poorly by management, the results may be less satisfactory, highlighting the important role of organizational context and managerial support in work design and redesign interventions.

However, as noted, neither review came to a definitive conclusion. This is due to the scarcity of studies relative to the wide variety of possible work design interventions; poor research designs for studying change, with few quasi-experiments and randomized controlled trials; and small sample sizes and short follow-up periods. These evaluations suggest the need for study designs that isolate the direct effect of the interventions as well as underlying causal mechanisms. However, such studies are often not feasible in organizational settings. We suggest three paths moving forward. First, qualitative studies could integrate detailed information on intervention characteristics, organizational context, and employee experiences to understand the intervention and its effects in the organizational context. Second, research can leverage algorithmic systems and big data to better examine work design interventions in context, specifically by assessing fine-grained outcomes of job design interventions over time and identifying when and for whom job design interventions work. Third, studies should be designed to acknowledge the importance of examining the social and organizational environment in shaping work design and redesign practices.

This alignment among organizational strategies, HR practices, and work design or redesign is of fundamental importance, especially in times of significant technological and ecological change in work organizations (Christina et al. 2017).

4.2.3. Future directions for interventions. Different forms of digitalization can influence work design, and, at the same time, work design can mitigate the potential negative effects of digitalization on work quality (Kellogg et al. 2020, Parent-Rocheleau & Parker 2022, Parker & Grote 2022).

First, the design phase of digital technologies and their implementation in work organizations must be reassessed. A large amount of psychological knowledge is already available regarding the possible negative impacts of new technologies on autonomy and skill and task variety. In addition, constant monitoring and impersonal feedback can have negative effects, and there can be a loss of task significance and meaning of work. The application of this existing work design knowledge to engineering and computer sciences can result in better psychological ergonomics and human-centered technology.

Second, a sociotechnical perspective in HR management should be adopted. This perspective would not only seek solutions for adapting the individual to technology but also lead to an integration of individual needs, skills, and expectations with the constraints and resources offered by technologies. Such a sociotechnical perspective can start with the development of job analysis techniques (described above) that accurately capture how human work and advanced technologies can be integrated. This will also help define the interdependence between humans and AI or robots, leading to greater transparency, reduced opacity, and greater trust (Natl. Acad. Sci. Eng. Med. 2022).



4.3. Job Design Models in the New Economy

Although existing work design models capture many features associated with the new economy, we note two approaches for their future development. First, additional work characteristics that are emerging in the new economy—impersonal management, always-on culture, gig work, and opacity of decisions, to name a few—can be identified and added explicitly to work design models (e.g., as demands or hindrance stressors). Second, given increasing workforce diversity, the North American and Eurocentric nature of existing models should be addressed in future development of job design models. This might include borrowing concepts such as respectful design (e.g., Tunstall 2020) from fields such as cultural anthropology.

5. CONCLUSION

Models of work design emerged in the twentieth century as a result of workplace changes created by the industrial revolution, resulting in a solid understanding of how job characteristics can affect worker well-being and performance. The workplace is now undergoing a new, profound revolution in terms of technology, demographics, instability, and environmental sustainability, affecting organizations and workers alike. These changes will require a rethinking of how work is designed to support employees and organizations, as well as research on emerging work design issues. Luckily, the field is starting from a place of strength, with robust theories and models of work design to help tackle these challenges.

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ACKNOWLEDGMENTS

We thank Miren Elizabeth Chenevert for her invaluable work of editing and curating the Literature Cited.

LITERATURE CITED

- Achdut N, Stier H. 2021. The role of monetary and non-monetary job quality components in determining welfare exit. *J. Soc. Policy* 50(1):79–103
- Bakker AB, Demerouti E, Sanz-Vergel A. 2023. Job demands–resources theory: ten years later. *Annu. Rev. Organ. Psychol. Organ. Behav.* 10:25–53
- Baldwin RE. 2019. *The Globalization Upheaval: Globalisation, Robotics, and the Future of Work*. London: Weidenfeld & Nicolson
- Benach J, Vives A, Amable M, Vanroelen C, Tarafa G, Muntaner C. 2014. Precarious employment: understanding an emerging social determinant of health. *Annu. Rev. Public Health* 35:229–53
- Bidadanure JU. 2019. The political theory of universal basic income. *Annu. Rev. Political Sci.* 22:481–501
- Blustein DL, Lysova EI, Duffy RD. 2023. Understanding decent work and meaningful work. *Annu. Rev. Organ. Psychol. Organ. Behav.* 10:289–314
- Brougham D, Haar J. 2018. Smart technology, artificial intelligence, robotics, and algorithms (STARA): employees' perceptions of our future workplace. *J. Manag. Organ.* 24(2):239–57
- Browne I, Misra J. 2003. The intersection of gender and race in the labor market. *Annu. Rev. Sociol.* 29:487–513
- Cadiz DM, Brady GM, Yaldiz LM, Zaniboni S, Truxillo DM. 2022. Age stereotypes do matter: looking through the lens of the attraction–selection–attrition model. *Work Aging Retire.* 8(4):339–42
- Campion MA, Fink AA, Ruggeberg BJ, Carr L, Phillips GM, Odman RB. 2011. Doing competencies well: best practices in competency modeling. *Pers. Psychol.* 64(1):225–62
- Carter KM, Hetrick AL, Chen M, Humphrey SE, Morgeson FP, Hoffman BJ. 2023. How culture shapes the influence of work design characteristics: a narrative and meta-analytic review. *J. Manag.* <https://doi.org/10.1177/01492063231179405>
- Cascio WF, Montealegre R. 2016. How technology is changing work and organizations. *Annu. Rev. Organ. Psychol. Organ. Behav.* 3:349–75
- Chancel L, Piketty T. 2021. Global income inequality, 1820–2020: the persistence and mutation of extreme inequality. *J. Eur. Econ. Assoc.* 19(6):3025–62
- Charlesworth TES, Banaji MR. 2019. Patterns of implicit and explicit attitudes: long-term change and stability from 2007 to 2016. *Psychol. Sci.* 30(2):174–92
- Chavez LJ, Ornelas IJ, Lyles CR, Williams EC. 2015. Racial/ethnic workplace discrimination. *Am. J. Prev. Med.* 48(1):42–49
- Cheng MM, Hackett RD. 2021. A critical review of algorithms in HRM: definition, theory, and practice. *Hum. Resour. Manag. Rev.* 31(1):100698
- Christina S, Dainty A, Daniels K, Tregaskis O, Waterson P. 2017. Shut the fridge door! HRM alignment, job redesign and energy performance. *Hum. Resour. Manag. J.* 27(3):382–402
- Cleveland JN, Shore LM, Anderson K, Huebner L-A, Sanchez D. 2018. Moving forward from inequality and discrimination: historical global perspectives. In *The Oxford Handbook of Workplace Discrimination*, ed. AJ Colella, EB King, pp. 423–34. Oxford, UK: Oxford Univ. Press
- Corbière M, Zaniboni S, Lecomte T, Bond G, Gilles PY, et al. 2011. Job acquisition for people with severe mental illness enrolled in supported employment programs: a theoretically grounded empirical study. *J. Occup. Rehabil.* 21(3):342–54
- Cortes P, Pan J. 2017. Cross-country evidence on the relationship between overwork and skilled women's job choices. *Am. Econ. Rev.* 107(5):105–9
- Daniels K, Gedikli C, Watson D, Semkina A, Vaughn O. 2017. Job design, employment practices and well-being: a systematic review of intervention studies. *Ergonomics* 60(9):1177–96
- Di Stasio V, Larsen EN. 2020. The racialized and gendered workplace: applying an intersectional lens to a field experiment on hiring discrimination in five European labor markets. *Soc. Psychol. Q.* 83(3):229–50

- Diekman AB, Clark EK, Belanger AL. 2019. Finding common ground: synthesizing divergent theoretical views to promote women's STEM pursuits. *Soc. Issues Policy Rev.* 13(1):182–210
- Dierdorff EC, Morgeson FP. 2013. Getting what the occupation gives: exploring multilevel links between work design and occupational values. *Pers. Psychol.* 66(3):687–721
- Duggan J, Sherman U, Carbery R, McDonnell A. 2020. Algorithmic management and app-work in the gig economy: a research agenda for employment relations and HRM. *Hum. Resour. Manag. J.* 30(1):114–32
- Ellemers N. 2018. Gender stereotypes. *Annu. Rev. Psychol.* 69:275–98
- Fauzi MA, Kamaruzzaman ZA, Abdul Rahman H. 2022. Bibliometric review on human resources management and big data analytics. *Int. J. Manpow.* In press. <http://doi.org/10.1108/IJM-05-2022-0247>
- Fazi L, Zaniboni S, Estreder Y, Truxillo DM, Fraccaroli F. 2019. The role of age in the relationship between work social characteristics and job attitudes. *J. Workplace Behav. Health* 34(2):77–95
- Fiske ST, Taylor SE. 2010. *Social Cognition: From Brains to Culture*. London: SAGE
- Flage A. 2019. Discrimination against gays and lesbians in hiring decisions: a meta-analysis. *Int. J. Manpow.* 41(6):671–91
- Fraccaroli F, Zaniboni S, Truxillo DM. 2017. Job design and older workers. In *Advanced Series in Management*, Vol. 17: *Age Diversity in the Workplace*, ed. S Profili, A Sammarra, L Innocenti, pp. 139–59. Bingley, UK: Emerald
- Goos M, Manning A, Salomons A. 2014. Explaining job polarization: routine-biased technological change and offshoring. *Am. Econ. Rev.* 104(8):2509–26
- Grant AM. 2007. Relational job design and the motivation to make a prosocial difference. *Acad. Manag. Rev.* 32(2):393–417
- Grant AM, Fried Y, Parker SK, Frese M. 2010. Putting job design in context: introduction to the special issue. *J. Organ. Behav.* 31(2/3):145–57
- Grote G, Guest D. 2017. The case for reinvigorating quality of working life research. *Hum. Relat.* 70(2):149–67
- Guest D, Knox A, Warhurst C. 2022. Humanizing work in the digital age: lessons from socio-technical systems and quality of working life initiatives. *Hum. Relat.* 75(8):1461–82
- Hackman JR, Oldham GR. 1975. Development of the job diagnostic survey. *J. Appl. Psychol.* 60(2):159–70
- Hackman JR, Oldham GR. 1976. Motivation through the design of work: test of a theory. *Organ. Behav. Hum. Perform.* 16(2):250–79
- Hackman JR, Oldham GR. 1980. *Work Redesign*. Reading, MA: Addison-Wesley
- Hall EV, Hall AV, Galinsky AD, Phillips KW. 2019. MOSAIC: a model of stereotyping through associated and intersectional categories. *Acad. Manag. Rev.* 44(3):643–72
- Halonon JI, Mänty M, Pietiläinen O, Kujanpää T, Kanerva N, et al. 2020. Physical working conditions and subsequent disability retirement due to any cause, mental disorders and musculoskeletal diseases: Does the risk vary by common mental disorders? *Soc. Psychiatry Psychiatr. Epidemiol.* 55(8):1021–29
- Hertel G, Stone DL, Johnson RD, Passmore J. 2017. The psychology of the internet @ work. In *The Wiley Blackwell Handbook of the Psychology of the Internet at Work*, ed. G Hertel, DL Stone, RD Johnson, J Passmore, pp. 1–18. Chichester, UK: Wiley
- Hiilamo A, Shiri R, Kouvonen A, Mänty M, Butterworth P, et al. 2019. Common mental disorders and trajectories of work disability among midlife public sector employees—a 10-year follow-up study. *J. Affect. Disord.* 247:66–72
- Holman D. 2013a. An explanation of cross-national variation in call centre job quality using institutional theory. *Work Employ. Soc.* 27(1):21–38
- Holman D. 2013b. Job types and job quality in Europe. *Hum. Relat.* 66(4):475–502
- Holman D, Rafferty A. 2018. The convergence and divergence of job discretion between occupations and institutional regimes in Europe from 1995 to 2010: the convergence and divergence of job discretion. *J. Manag. Stud.* 55(4):619–47
- Holvino E, Feldman BM, Merrill-Sands D. 2004. Creating and sustaining diversity and inclusion in organizations: strategies and approaches. In *The Psychology and Management of Workplace Diversity*, ed. MS Stockdale, pp. 245–76. Malden, MA: Blackwell
- Hornung S, Rousseau DM, Glaser J, Angerer P, Weigl M. 2010. Beyond top-down and bottom-up work redesign: customizing job content through idiosyncratic deals. *J. Organ. Behav.* 31(2/3):187–215

- Humphrey SE, Nahrgang JD, Morgeson FP. 2007. Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *J. Appl. Psychol.* 92(5):1332–56
- Jabagi N, Croteau AM, Audebrand LK, Marsan J. 2019. Gig-workers' motivation: thinking beyond carrots and sticks. *J. Manag. Psychol.* 34(4):192–213
- Jatobá MN, Ferreira JJ, Fernandes PO, Teixeira JP. 2023. Intelligent human resources for the adoption of artificial intelligence: a systematic literature review. *J. Organ. Change Manag.* In press. <https://doi.org/10.1108/JOCM-03-2022-0075>
- Johns G. 2006. The essential impact of context on organizational behavior. *Acad. Manag. Rev.* 31(2):386–408
- Jones KP, Peddie CI, Gilrane VL, King EB, Gray AL. 2016. Not so subtle: a meta-analytic investigation of the correlates of subtle and overt discrimination. *J. Manag.* 42(6):1588–613
- Joshi A, Son J, Roh H. 2015. When can women close the gap? A meta-analytic test of sex differences in performance and rewards. *Acad. Manag. J.* 58(5):1516–45
- Kellogg KC, Valentine MA, Christin A. 2020. Algorithms at work: the new contested terrain of control. *Acad. Manag. Ann.* 14(1):366–410
- Knight C, Parker SK. 2021. How work redesign interventions affect performance: an evidence-based model from a systematic review. *Hum. Relat.* 74(1):69–104
- Kolade O, Owoseni A. 2022. Employment 5.0: the work of the future and the future of work. *Technol. Soc.* 71:102086
- Kouvonen A, Mänty M, Lallukka T, Lahelma E, Rahkonen O. 2016. Changes in psychosocial and physical working conditions and common mental disorders. *Eur. J. Public Health* 26(3):458–63
- Kramer A, Kramer KZ. 2020. The potential impact of the Covid-19 pandemic on occupational status, work from home, and occupational mobility. *J. Vocat. Behav.* 119:103442
- Lahelma E, Laaksonen M, Lallukka T, Martikainen P, Pietiläinen O, et al. 2012. Working conditions as risk factors for disability retirement: a longitudinal register linkage study. *BMC Public Health* 12:309
- Laine H, Saastamoinen P, Lahti J, Rahkonen O, Lahelma E. 2014. The associations between psychosocial working conditions and changes in common mental disorders: a follow-up study. *BMC Public Health* 14:588
- Lau B, Shiryayeva O, Ruud T, Victor M. 2019. What are they returning to? Psychosocial work environment as a predictor of returning to work among employees in treatment for common mental disorders: a prospective observational pre-post study. *PLOS ONE* 14(4):e0215354
- Law PCF, Too LS, Butterworth P, Witt K, Reavley N, Milner AJ. 2020. A systematic review on the effect of work-related stressors on mental health of young workers. *Int. Arch. Occup. Environ. Health* 93(5):611–22
- Lesener T, Gusy B, Wolter C. 2019. The job demands-resources model: a meta-analytic review of longitudinal studies. *Work Stress* 33(1):76–103
- Lin W, Shao Y, Li G, Guo Y, Zhan X. 2021. The psychological implications of COVID-19 on employee job insecurity and its consequences: the mitigating role of organization adaptive practices. *J. Appl. Psychol.* 106(3):317–29
- Llorens A, Tzovara A, Bellier L, Bhaya-Grossman I, Bidet-Caulet A, et al. 2021. Gender bias in academia: a lifetime problem that needs solutions. *Neuron* 109(13):2047–74
- Lopes H, Calapez T. 2021. Job polarisation: capturing the effects of work organisation. *Econ. Labour Relat. Rev.* 32(4):594–613
- Malhotra A. 2021. The postpandemic future of work. *J. Manag.* 47(5):1091–102
- McCarthy JM, Truxillo DM, Bauer TN, Erdogan B, Shao Y, et al. 2021. Distressed and distracted by COVID-19 during high-stakes virtual interviews: the role of job interview anxiety on performance and reactions. *J. Appl. Psychol.* 106(8):1103–17
- McFadden C. 2020. Discrimination against transgender employees and jobseekers. In *Handbook of Labor, Human Resources and Population Economics*, ed. KF Zimmermann, pp. 1–14. Cham, Switz.: Springer
- Melaku TM. 2019. *You Don't Look Like a Lawyer: Black Women and Systemic Gendered Racism*. Lanham, MD: Rowman & Littlefield
- Mize TD. 2016. Sexual orientation in the labor market. *Am. Soc. Rev.* 81(6):1132–60
- Mor Barak ME. 2005. *Managing Diversity: Toward a Globally Inclusive Workplace*. Thousand Oaks, CA: SAGE. 1st ed.

- Mor Barak ME. 2022. *Managing Diversity: Toward a Globally Inclusive Workplace*. Thousand Oaks, CA: SAGE. 5th ed.
- Morgeson FP, Brannick MT, Levine EL. 2020. *Job and Work Analysis: Methods, Research, and Applications for Human Resource Management*. London: SAGE. 3rd ed.
- Morgeson FP, Dierdorff EC, Hmurovic JL. 2010. Work design in situ: understanding the role of occupational and organizational context. *J. Organ. Behav.* 31(2/3):351–60
- Morgeson FP, Humphrey SE. 2006. The Work Design Questionnaire (WDQ): developing and validating a comprehensive measure for assessing job design and the nature of work. *J. Appl. Psychol.* 91(6):1321–39
- Morgeson FP, Humphrey SE. 2008. Job and team design: toward a more integrative conceptualization of work design. In *Research in Personnel and Human Resource Management*, ed. JJ Martocchio, pp. 39–91. Bingley, UK: Emerald
- Morgeson FP, Mitchell TR, Liu D. 2015. Event system theory: an event-oriented approach to the organizational sciences. *Acad. Manag. Rev.* 40(4):515–37
- Natl. Acad. Sci. Eng. Med. 2022. *Human–AI Teaming: State-of-the-Art and Research Needs*. Washington, DC: Natl. Acad. <https://doi.org/10.17226/26355>
- Nevala-Puranen N, Seuri M, Simola A, Elo J. 1999. Physically disabled at work: need for ergonomic interventions. *J. Occup. Rehabil.* 9(4):215–25
- Ng TWH, Feldman DC. 2008. The relationship of age to ten dimensions of job performance. *J. Appl. Psychol.* 93(2):392–423
- Ng TWH, Feldman DC. 2015. Ethical leadership: meta-analytic evidence of criterion-related and incremental validity. *J. Appl. Psychol.* 100(3):948–65
- Nigatu YT, Liu Y, Uppal M, McKinney S, Gillis K, et al. 2017. Prognostic factors for return to work of employees with common mental disorders: a meta-analysis of cohort studies. *Soc. Psychiatry Psychiatr. Epidemiol.* 52(10):1205–15
- OECD. 2018. *Good Jobs for All in a Changing World of Work: The OECD Jobs Strategy*. Paris: OECD
- Olinto MTA, Garcez A, Henn RL, Macagnan JBA, Paniz VMV, Pattussi MP. 2017. Sleep-related problems and minor psychiatric disorders among Brazilian shift workers. *Psychiatry Res.* 257:412–17
- O’Shea D, Peiró JM, Truxillo DM. 2024. Redressing underemployment. In *Tackling Precarious Work: Toward Sustainable Livelihoods*, ed. SC Carr, V Hopner, D Hodgetts, M Young. USA: Routledge/Taylor & Francis. In press
- Osterman P. 2010. Job design in the context of the job market. *J. Organ. Behav.* 31(2/3):401–11
- Oswald FL, Behrend TS, Putka DJ, Sinar E. 2020. Big data in industrial-organizational psychology and human resource management: forward progress for organizational research and practice. *Annu. Rev. Organ. Psychol. Organ. Behav.* 7:505–33
- Pan Y, Froese FJ. 2023. An interdisciplinary review of AI and HRM: challenges and future directions. *Hum. Resour. Manag. Rev.* 33(1):100924
- Parent-Rocheleau X, Parker SK. 2022. Algorithms as work designers: how algorithmic management influences the design of jobs. *Hum. Resour. Manag. Rev.* 32(3):100838
- Parker SK. 2014. Beyond motivation: job and work design for development, health, ambidexterity, and more. *Annu. Rev. Psychol.* 65:661–91
- Parker SK, Grote G. 2022. Automation, algorithms, and beyond: why work design matters more than ever in a digital world. *Appl. Psychol.* 71(4):1171–204
- Parker SK, Jorritsma K. 2021. Good work design for all: multiple pathways to making a difference. *Eur. J. Work Organ. Psychol.* 30(3):456–68
- Parker SK, Morgeson FP, Johns G. 2017. One hundred years of work design research: looking back and looking forward. *J. Appl. Psychol.* 102(3):403–20
- Pethig F, Kroenung J. 2022. Biased humans, (un)biased algorithms? *J. Bus. Ethics* 183(1):637–52
- Plug E, Berkhout P. 2004. Effects of sexual preferences on earnings in the Netherlands. *J. Popul. Econ.* 17(1):117–31
- Pozniak H. 2021. Plug the gap: retrain for net zero: Workers at all levels need new skills for the green economy. Government and employers must act now to build a coherent strategy and invest in training. *Eng. Technol.* 16(10):1–4

- Preston A, Birch E, Timming AR. 2019. Sexual orientation and wage discrimination: evidence from Australia. *Int. J. Manpow.* 41(6):629–48
- Putka DJ, Oswald FL. 2016. Implications of the big data movement for the advancement of I-O science and practice. In *Big Data at Work: The Data Science Revolution and Organizational Psychology*, ed. S Tonidandel, EB King, JM Cortina, pp. 181–212. New York: Routledge/Taylor & Francis
- Putka DJ, Oswald FL, Landers RN, Beatty AS, McCloy RA, Yu MC. 2023. Evaluating a natural language processing approach to estimating KSA and interest job analysis ratings. *J. Bus. Psychol.* 38(2):385–410
- Raisch S, Krakowski S. 2021. Artificial intelligence and management: the automation–augmentation paradox. *Acad. Manag. Rev.* 46(1):192–210
- Rudolph CW, Allan B, Clark M, Hertel G, Hirschi A, et al. 2021. Pandemics: implications for research and practice in industrial and organizational psychology. *Ind. Organ. Psychol.* 14(1/2):1–35
- Sanchez JI, Levine EL. 2012. The rise and fall of job analysis and the future of work analysis. *Annu. Rev. Psychol.* 63:397–425
- Shore LM, Cleveland JN, Sanchez D. 2018. Inclusive workplaces: a review and model. *Hum. Resour. Manag. Rev.* 28(2):176–89
- Shultz KS, Wang M, Crimmins EM, Fisher GG. 2010. Age differences in the demand–control model of work stress: an examination of data from 15 European countries. *J. Appl. Gerontol.* 29(1):21–47
- Soc. Ind. Organ. Psychol. 2018. *Principles for the Validation and Use of Personnel Selection Procedures*. Bowling Green, OH: Soc. Ind. Organ. Psychol. 5th ed.
- Soc. Ind. Organ. Psychol. 2023. *Considerations and Recommendations for the Validation and Use of AI-Based Assessments for Employee Selection*. Bowling Green, OH: Soc. Ind. Organ. Psychol.
- Spreitzer GM, Cameron L, Garrett L. 2017. Alternative work arrangements: two images of the new world of work. *Annu. Rev. Organ. Psychol. Organ. Behav.* 4:473–99
- Stainback K, Jason K, Walter C. 2018. Organizational context and the well-being of black workers: Does racial composition affect psychological distress? In *Research in the Sociology of Work*, Vol. 32: *Race, Identity, and Work*, ed. EL Mickey, AH Wingfield, pp. 137–64. Bingley, UK: Emerald
- Strah N, Rupp DE. 2022. Are there cracks in our foundation? An integrative review of diversity issues in job analysis. *J. Appl. Psychol.* 107(7):1031–51
- Tordera N, Peiró JM, Ayala Y, Villajos E, Truxillo DM. 2020. The lagged influence of organizations' human resources practices on employees' career sustainability: the moderating role of age. *J. Vocat. Behav.* 120:103444
- Trist EL, Bamforth KW. 1951. Some social and psychological consequences of the longwall method of coal-getting: an examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system. *Hum. Relat.* 4(1):3–38
- Truxillo DM, Cadiz DM, Rineer JR, Zaniboni S, Fraccaroli F. 2012. A lifespan perspective on job design: fitting the job and the worker to promote job satisfaction, engagement, and performance. *Organ. Psychol. Rev.* 2(4):340–60
- Tunstall ED. 2020. Decolonizing design innovation: design anthropology, critical anthropology, and indigenous knowledge. In *Design Anthropology: Theory and Practice*, ed. W Gunn, T Otto, RC Smith, pp. 221–40. Abingdon, UK: Routledge/Taylor & Francis
- Urbanetto JS, Magalhaes MCC, Maciel VO, Sant'Anna VM, Gustavo AS, et al. 2013. [Work-related stress according to the demand-control model and minor psychic disorders in nursing workers.] *Rev. Esc. Enferm. USP* 47(5):1180–86 (in Portuguese)
- Valfort MA. 2017. *LGBTI in OECD countries: a review*. Soc. Employ. Migr. Work. Pap. 198, OECD, Paris
- Vanroelen C, Julià M, Van Aerden K. 2021. Precarious employment: an overlooked determinant of workers' health and well-being? In *Flexible Working Practices and Approaches*, ed. C Korunka, pp. 231–55. Cham, Switz.: Springer
- Villotti P, Corbière M, Zaniboni S, Lecomte T, Fraccaroli F. 2015. Evaluating the motivation to obtain and sustain employment in people with psychiatric disabilities. *Psicol. Soc.* 10(1):57–70
- Warhurst C, Knox A. 2022. Manifesto for a new quality of working life. *Hum. Relat.* 75(2):304–21
- Wegman LA, Hoffman BJ, Carter NT, Twenge JM, Guenole N. 2018. Placing job characteristics in context: cross-temporal meta-analysis of changes in job characteristics since 1975. *J. Manag.* 44(1):352–86

- Wingfield AH, Chavez K. 2020. Getting in, getting hired, getting sideways looks: organizational hierarchy and perceptions of racial discrimination. *Am. Soc. Rev.* 85(1):31–57
- Zacher H, Dirkers BT, Korek S, Hughes B. 2017. Age-differential effects of job characteristics on job attraction: a policy-capturing study. *Front. Psychol.* 8:1124
- Zacher H, Frese M. 2011. Maintaining a focus on opportunities at work: the interplay between age, job complexity, and the use of selection, optimization, and compensation strategies. *J. Organ. Behav.* 32(2):291–318
- Zacher H, Schmitt A. 2016. Work characteristics and occupational well-being: the role of age. *Front. Psychol.* 7:1411
- Zaniboni S, Kmicinska M, Truxillo DM, Kahn K, Paladino MP, Fraccaroli F. 2019. Will you still hire me when I am over 50? The effects of implicit and explicit age stereotyping on resume evaluations. *Eur. J. Work Organ. Psychol.* 28(4):453–67
- Zaniboni S, Truxillo DM, Fraccaroli F. 2013. Differential effects of task variety and skill variety on burnout and turnover intentions for older and younger workers. *Eur. J. Work Organ. Psychol.* 22(3):306–17
- Zaniboni S, Truxillo DM, Fraccaroli F, McCune AE, Bertolino M. 2014. Who benefits from more tasks? Older versus younger workers. *J. Manag. Psychol.* 29(5):508–23
- Zaniboni S, Truxillo DM, Rineer JR, Bodner TE, Hammer LB, Krainer M. 2016. Relating age, decision authority, job satisfaction, and mental health: a study of construction workers. *Work Aging Retire.* 2(4):428–35
- Zschirnt E, Ruedin D. 2016. Ethnic discrimination in hiring decisions: a meta-analysis of correspondence tests 1990–2015. *J. Ethn. Migr. Stud.* 42(7):1115–34